



Bacteria Equivalency Strategy for Using the Optimal Indicator Organisms for WQS and NPDES Permitting

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1.0 Technical and Regulatory Background

The Clean Water Act (CWA) authorizes US EPA and delegated states to develop and implement water quality standards to protect human health and the environment. Pathogens and viruses from fecal contamination are a significant pollutant that can cause negative human health outcomes for people who come in contact with contaminated waters. US EPA recommended the use of fecal coliform bacteria as a pathogen indicator¹ for fecal contamination in the 1970s. Research and epidemiological studies in the 1970s and early 1980s showed the efficacy of enterococci as an indicator of fecal contamination in marine waters and *Escherichia coli* (*E. coli*) as an indicator of fecal contamination in freshwaters. US EPA updated their fecal indicator recommendations in 1986 to reflect these findings.

In November 2012, US EPA published updated national recommended water quality criteria for primary recreation waters to protect human health from bacteria during immersive water contact activities such as swimming. The updated criteria are based on the National Epidemiological and Environmental Assessment of Recreational Water (NEEAR) study, (US EPA, 2010). The NEEAR study used a primary contact gastrointestinal illness rate of 8 per 1000 recreators to derive the *E. coli* criteria and a gastrointestinal illness rate of 19 per 1000 recreators to derive the enterococci criteria.

2.0 Development and approval of the bacteria water quality standard using optimal indicator organisms

During the 2013 Triennial Review, Georgia adopted *E. coli* and enterococci as the pathogen indicators for waters designated as recreation where primary contact recreational activities such as swimming, water skiing, and white-water boating occur. The instream criteria are given as a 30-day geometric mean and a Statistical Threshold Value (STV), which represents the estimated 90th percentile of the water quality distribution.

As part of the 2019 Triennial Review, Georgia proposed *E. coli* and enterococci criteria for waters designated as fishing, coastal fishing, and drinking water to protect secondary contact recreators who may inadvertently ingest water. Georgia EPD adopted the primary contact criteria for the recreational months, May through October, when immersion is expected to occur. For November through April, when immersion is expected to be limited, EPD adopted secondary contact recreational criteria based on the estimated incidental water consumption rate from the EPA 2019 update to Chapter 3 of the Exposure Factors Handbook, Ingestion of Water and Other Select Liquids to the *Exposure Factors Handbook: 2011 Edition*. EPD calculated the secondary contact criteria based on a water ingestion rate for secondary contact recreators that is 2.1 times less than for primary contact recreators. As a result, both primary and secondary contact recreation criteria yield the same gastrointestinal illness rate (8 per 1000 recreators for *E. coli* and 19 per 1000 recreators for enterococci) and are equally protective of human health.

The proposed summer-time *E. coli* criteria meet the same illness rate as the current fecal coliform criteria and, therefore, are as protective as the current summer-time fecal coliform criteria. The proposed winter-time *E. coli* criteria are more stringent and, as a result, more protective than the current winter-time fecal coliform criteria for secondary contact recreation. Therefore, the new bacteria criteria are equivalently protective of human health as the fecal coliform criteria (same illness rate).

¹ A pathogen indicator, as defined in section 502(23) of the CWA, is “a substance that indicates the potential for human infectious disease.”

2.1 Removal of bacteria criteria specific to non-human sources

The proposed language for the *E. coli* and enterococci criteria for waters designated as fishing, coastal fishing, and drinking water to protect secondary contact recreators also removed higher bacteria criteria for fecal coliform in the case where water quality and sanitary studies showed that fecal coliform from non-human sources exceeded the instream water quality standard. This change was motivated by two considerations. First, fecal coliform is a large group of bacteria, which includes some groups, such as *klebsiella*, that are not necessarily fecal in origin. *E. coli* and enterococci are better indicators of fecal contamination and gastrointestinal illness than fecal coliform. Studies that show a large contribution of non-human sources to the fecal coliform in a waterbody may indicate lower risk of gastrointestinal illness. Second, EPA's recommended recreational bacteria criteria guidance for *E. coli* and enterococci does not make any allowances for non-human sources of bacteria. With this change, all the designated uses are equally protective of primary contact recreation.

The proposed criteria must be approved by the DNR Board before they can go into effect. The proposed criteria must be approved by US EPA prior to use for Clean Water Act purposes. This section will be updated with specific timelines pending Board approval.

3.0 Ambient Monitoring Transition

EPD currently monitors 145 sites for fecal coliform and 90 sites for *E. coli* each year. At approximately 20 sites, both fecal coliform and *E. coli* are monitored. EPD monitors all *E. coli* sites and approximately half of the fecal coliform sites every year as part of the state's trend monitoring efforts. This leaves EPD with the capacity to monitor approximately 70 new sites a year.

Beginning in 2022, EPD will start monitoring for *E. coli* and enterococci instead of fecal coliform, prioritizing segments that had been identified previously as impaired for fecal coliform. EPD will reassess the sites impaired for fecal coliform for *E. coli* or enterococci at a rate of approximately 70 sites per year. By initiating this shift in monitoring in 2022, EPD will be prepared to include the most up-to-date information for the appropriate bacteria criteria for the 2024 303(d)/305(b) List and Integrated Report.

Georgia's Coastal Resources Division (CRD) designates certain waters of the State as shellfish growing areas and further designates shellfish harvesting areas within those growing areas. CRD monitors these waters for fecal coliform contamination in accordance with Food and Drug Administration (FDA) requirements. Waters within "shellfish growing areas" are not subject to the change to *E. coli*. Georgia's 2020 303(d)/305(b) list includes one water listed as impaired for fecal coliform based on shellfish criteria (GAR030602040121 - Betz Creek; TMDL issued in 2016). Another water is anticipated to be listed in the 2022 list (GAR030602040120 – Bull River).

3.1 Sampling Quality Assurance Plans

Interested stakeholders may submit data for use in the development in the 2024 305(b)/303(d) List provided they have an EPD-approved Sampling and Quality Assurance Plan (SQAP) in accordance with Chapter 391-3-6-.03(13) of the Rules and Regulations for Water Quality Control. Historically, most third parties have focused on collecting fecal coliform data on waters that are assessed as impaired for fecal coliform. SQAP data is typically used for delisting a water for fecal coliform rather than listing waters as impaired for fecal coliform.

Stakeholders with approved SQAPs for fecal coliform bacteria will be contacted by letter once the Board of Natural Resources adopts the change in pathogen indicator. This letter will inform the stakeholders of the anticipated change from fecal coliform to *E. coli* or enterococci and their associated criteria in the near future (approximately 3 to 6 months). The SQAP stakeholders will be advised that the fecal coliform data collected before the new criteria are approved by US EPA will be used in 2024 305(b)/303(d) List development, and to submit their fecal coliform data no later than June 30, 2023. Furthermore, the SQAP stakeholders will be informed that after US EPA approves the new pathogen indicators and their criteria, EPD will not use fecal coliform data for 305(b)/303(d) purposes and a revised SQAP reflecting the change in pathogen indicator will need to be submitted to continue data submittal for waterbodies they are currently sampling.

Upon US EPA approval of the proposed criteria, the SQAP stakeholders will be contacted again by letter to notify them of the approval and to remind them to submit a revision to their SQAP for the new pathogen indicator(s) if they want their data to be used for 305(b)/303(d) assessment purposes.

4.0 TMDL Updates and Implementation

4.1 Background

Georgia EPD has developed more than 900 fecal coliform TMDLs. The loading curve approach was used to compare the critical load that led to impairment to the allowable summer and winter seasonal loads. To determine the needed reduction, the critical loads or loads that violated the water quality standards were determined using bacteria data collected consistent with Georgia's instream bacteria standards to calculate the geometric means and multiplying these values by the arithmetic means of the flows measured at the time the samples were collected. Georgia's instream bacteria standards are based on either a geometric mean of samples collected over a 30-day period, with samples collected at least 24 hours apart or the single sample maximum. To reflect this in the load calculation, the bacterial loads are expressed as 30-day accumulated loads with units of counts per 30 days or single day maximums depending on the criteria violated. This is described by the equation below:

$$L_{\text{critical}} = C_{\text{critical}} \times Q_{\text{mean}}$$

Where: L_{critical} = critical bacteria load

C_{critical} = critical bacteria concentration (as a 30-day geometric mean or single sample maximum) that violated the criteria

Q_{mean} = stream flow as an arithmetic mean

The maximum bacteria load at which the instream bacteria water quality criteria will be met can be determined by setting C equal to the instream bacteria criteria (C_{standard}). This load equals the TMDL. However, the TMDL is dependent on stream flow and is a continuum for the range of flows that can occur in the stream over time. An example of how the TMDL incorporates stream flow is provided below:

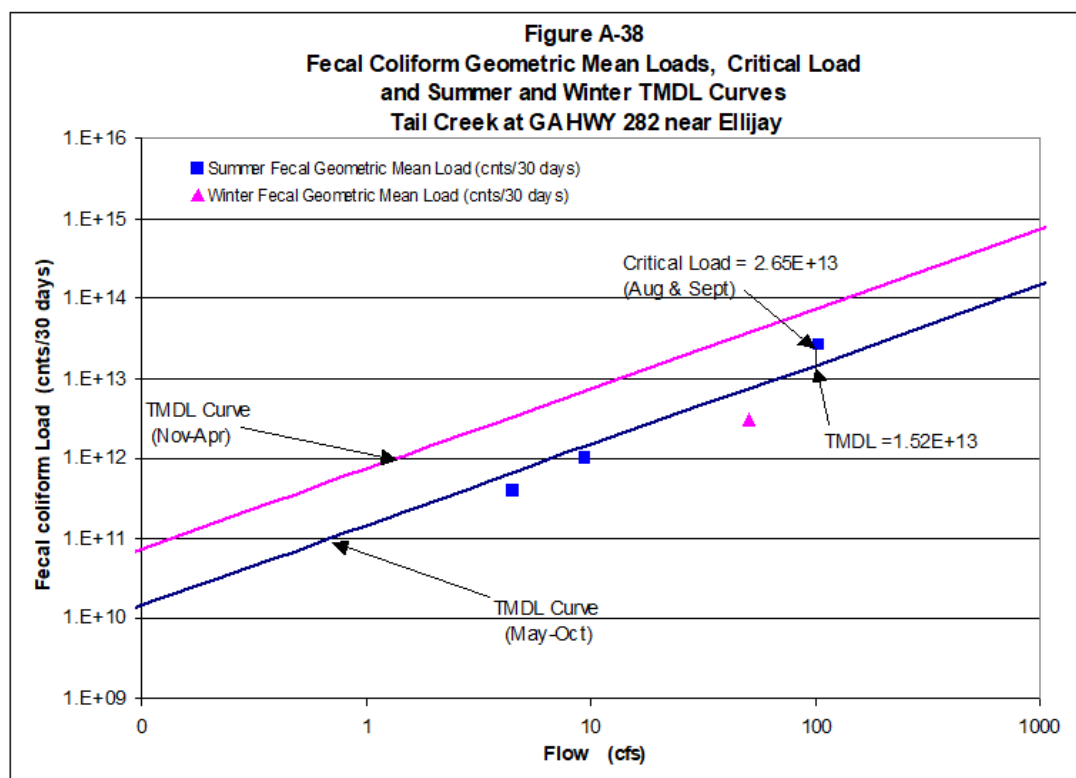


Table A-38. Data for Figure A-38, including: observed fecal coliform, instantaneous flow fecal coliform load, fecal coliform geometric mean, mean flow, fecal coliform geometric mean load.

Date	Observed Fecal Coliform (counts/100 ml)	Estimated Instantaneous Flow On Sample Day (cfs)	Geometric Mean (cnts/100 ml)	Mean Flow (cfs)	Geometric Mean Fecal Coliform Loading (cnts/30 days)	Geometric Mean TMDL Fecal Coliform Loading (cnts/30 days)
27-Feb-01	20	29				
5-Mar-01	50	32				
14-Mar-01	20	16				
20-Mar-01	2300	125	82	51	$3.05E+12$	$3.71E+13$
15-May-01	130	7				
22-May-01	490	7				
29-May-01	80	14				
12-Jun-01	90	10	146	9	$1.02E+12$	$1.39E+12$
28-Aug-01	40	5				
5-Sep-01	570	147				
10-Sep-01	460	257				
18-Sep-01	1400	6	348	104	$2.65E+13$	$1.52E+13$
2-Oct-01	81	5				
4-Oct-01	110	5				
9-Oct-02	170	4				
15-Oct-01	130	4	118	5	$3.91E+11$	$6.61E+11$

For waterbodies designated as recreational waters, a single curve represents the TMDL and is the 30-day recreational geometric mean criteria for the various bacterial indicators. For waterbodies designated as fishing, coastal fishing, and drinking water, two curves represent the TMDL. One curve represents the summer TMDL for the period May through October when the 30-day geometric mean water quality criteria is equal to the primary contact recreation bacteria criteria for

the various indicators, and the second curve represents the winter TMDL for the period November through April when the 30-day geometric mean criteria is higher and is equal to the secondary contact recreation bacteria criteria.

The TMDL also has a single sample maximum criterion for fecal coliform or a Statistical Threshold Value (STV) for *E. coli* and enterococci. The single sample maximum applies for the months of November through April; whereas the STV applies year-round. The STV shall not be exceeded more than 10% of the time in a 30-day period. If a single sample exceeds the maximum criterion or the STV and a geometric mean criterion was also exceeded, then the TMDL is based on the criteria exceedance requiring the largest load reduction. The difference between the critical load and the TMDL curve represented the load reduction required for the stream segment to meet the appropriate instream standard.

The TMDL load calculation is given using the following equation:

$$\text{TMDL} = C_{\text{standard}} \times Q$$

Where: TMDL = Total Maximum Bacteria Load either as a 30-day geometric mean or a single sample maximum

C_{standard} = applicable state water quality standard

Q = stream flow

The *E. coli* and enterococci water quality criteria are equivalently protective of human health as the fecal coliform criteria. The applicable water quality standard for fecal coliform is:

May-October 200 counts/100 mL (as a 30-day geometric mean)

November-April 1,000 counts/100 mL (as a 30-day geometric mean)

November-April 4,000 counts/100 mL (as a single sample maximum)

The applicable water quality standard for *E. coli* is:

May-October 126 counts/100 mL (as a 30-day geometric mean)

May-October 410 counts/100 mL (as a STV)

November-April 265 counts/100 mL (as a 30-day geometric mean)

November-April 861 counts/100 mL (as a STV)

The applicable water quality standard for enterococci is:

May-October 35 counts/100 mL (as a 30-day geometric mean)

May-October 130 counts/100 mL (as a STV)

November-April 74 counts/100 mL (as a 30-day geometric mean)

November-April 273 counts/100 mL (as a STV)

TMDLs represent the assimilative capacity of a specific waterbody or watershed and are the sum of all point source wasteload allocations (WLA) plus nonpoint source load allocations (LA) plus a margin of safety (MOS), or, stated as an equation, $\text{TMDL} = \sum \text{WLA} + \sum \text{LA} + \text{MOS}$. TMDLs have established WLAs for all point sources equivalent to the recreational 30-day geometric mean criteria. The LA has also been given as the appropriate seasonal 30-day geometric mean criteria.

4.2 Implementation

Based on communication with US EPA, EPD understands that states have the option to address the change in pathogen indicators by amending an existing TMDL's bacteria allocations to provide *E.*

coli or enterococci-based allocations in addition to the original fecal coliform-based allocations. The TMDL addendums will include WLA and LA for all bacteria indicators. The addendums will include equally protective 30-day geometric mean WLA for *E.coli* or enterococci, as well as appropriate seasonal (May through October and April through November) Statistical Threshold Values (STV) for *E. coli* or enterococci. The table below shows the equivalent bacteria criteria for the various bacteria indicators.

Designated Use	#/100 mL		
	Recreation	Drinking Water*/ Fishing	Drinking Water*/ Fishing
Bacteria Indicator	Year Round	May-October	November-April
Fecal Coliform			
30-day Geomean	200	200*	1000*
Single Sample Maximum			4000*
<i>E. coli</i>			
30-day Geomean	126	126*	265*
STV	410	410*	861*
Enterococci			
30-day Geomean	35	35	74
STV	130	130	273

* Criteria that apply to waterbodies designated as drinking water.

The addendums will be public noticed and approved by US EPA before becoming effective. A review of current fecal coliform TMDLs indicates that EPD will prepare 43 addendums and revise 9 US EPA bacteria TMDL documents, which will cover the over 900 waterbodies covered by existing fecal coliform TMDLs.

EPD has set a target date of December 31, 2022, for the development, public noticing, and approval of addendums for all existing fecal coliform TMDLs. A target date of September 30, 2023 has been set for the development, public noticing, and approval of TMDLs for all waterbodies on the 2022 303(d) List for fecal coliform. These TMDLs will include limits for both fecal coliform and *E. coli* or enterococci.

5.0 305(b)/303(d) Assessment Updates and Implementation

5.1 Background

Section 305(b) of the CWA requires states to assess their water quality every two years and publish their findings in a water quality report. To develop this report, Georgia compares water quality data collected across the state against the water quality standards using EPD's Listing Assessment Methodology and places each waterbody into one of three broad assessment categories: 1) supporting their designated use; 2) not supporting their designated use (impaired); or 3) assessment pending. Section 303(d) of the CWA requires states to submit a list of all waters that are not supporting their designated uses and need to have a Total Maximum Daily Load (TMDL) developed. EPD submits both lists concurrently to US EPA through the Integrated Report.

TMDLs will be developed for all segments impaired for fecal coliform on the 2022 303(d) List and waterbodies will be monitored for either *E. coli* or enterococci beginning in 2022, unless it is a

shellfish growing area designated by CRD. Therefore, the 2024 303(d) List will not contain any segments impaired for fecal coliform, except for those in shellfish growing areas as described in Section 3.0.

The 305(b) List will include all segments previously listed for fecal coliform and indicate that TMDLs have been completed for each one (Category 4a). The fecal coliform TMDL will remain in place and include addendums with WLA and LA for both fecal coliform and *E. coli* or enterococci. The impairment will be reassessed as new *E. coli* or enterococci data is collected, and an assessment can be conducted using the new pathogen indicator.

5.2 Implementation

The Listing Assessment Methodology provides information about the quantity and quality of data needed for listing decisions. In general, for a waterbody to be considered supporting, 10% or fewer of the bacteria samples (30-day geometric mean, single sample max, or STV) may exceed the specific water quality criteria. Provided that US EPA approves EPD's proposed bacteria criteria, EPD's 2024 Listing Assessment Methodology will reflect the approved bacteria criteria, and assessments for the 2024 List onward will use the new water quality standards reflecting the new bacteria indicator.

The 2024 303(d) List will not contain any segments impaired for fecal coliform, except for those in shellfish growing areas. The waterbodies will be identified on the 305(b) List as impaired for bacteria (fecal coliform) with a completed TMDL (Category 4a). The waterbody will remain in Category 4a based on the historic fecal coliform data that indicated that pathogens were likely present at levels that could result in human illness.

A review of historical Georgia-specific data where both *E. coli* and fecal coliform data were collected at a single location shows the majority of the time when fecal coliform data exceeded its criteria, the *E. coli* data also exceed its criteria. EPD looked at data from 2019 and 2020 where *E. coli* and fecal coliform samples were taken concurrently at the same location. Based on the calculated 148 paired 30-day geomeans for *E. coli* and fecal coliform, EPD found a high level of correlation between the *E. coli* and fecal coliform data. Approximately 85% of the time, the *E. coli* and fecal coliform 30-day geomeans either both met their criteria or both violated their criteria.

Once the criteria for fecal coliform have been replaced, the segments listed for fecal coliform will be assessed using the available *E. coli* or enterococci criteria. If no *E. coli* or enterococci data are available for assessment, EPD will collect *E. coli* or enterococci data to confirm the impairment. If the results of the assessment indicate *E. coli* or enterococci criteria are being met, then the waterbody will be moved to Category 1 (supporting their designated use).

6.0 NPDES Permitting Transition & Implementation

6.1 NPDES Point Source Wastewater Permitting

EPD is required to issue permits that protect human health and aquatic life. Based on the nature of a waste stream or of the treatment process, point source discharges may have the reasonable potential to discharge bacteria in quantities that may cause or contribute to a violation of the instream water quality standards for bacteria. Hence where appropriate, EPD includes effluent limits for bacteria protecting the instream bacteria water quality standards in point source wastewater NPDES permits.

EPD, US EPA, and the scientific community recognize *E. coli* and enterococci as far better indicators of pathogens that may cause human illness than fecal coliform bacteria. As discussed in

Section 1.0, in 2013 EPD adopted new bacterial indicators (*E. coli* and enterococci) for waterbodies with a designated use of recreation. After US EPA approved the new water quality criteria and as the permits authorizing discharges to recreational waterbodies came up for reissuance, EPD began transitioning the bacterial effluent limits from fecal coliform to *E.coli* or enterococci.

As was done in the past, once US EPA approves the new bacteria water quality criteria, EPD will begin issuing permits with the new bacterial indicators. EPD does not plan to open and modify current permits to include *E. coli* or enterococci effluent limits, as they will be included at the time of permit reissuance.

6.1.2 Calculating the WQBELs.

For use in NPDES point source wastewater permits, the *E. coli* and enterococci criteria must be translated into average monthly limits (AML) and average weekly limits (AWL) for POTWs and AML and maximum daily limits (MDL) for Non-POTWs. US EPA noted that there are two general approaches for establishing short and long-term effluent limits stringent enough to meet the proposed water quality criteria: the “end-of-pipe” approach and the Technical Support Document (TSD) approach (*FAQ: NPDES Water-Quality Based Permit Limits for Recreational Water Quality Criteria*, April 2015). EPD evaluated both approaches and determined that the “end of-pipe” approach is the most suitable for regulated community.

In the “end-of pipe” approach the water quality criteria for *E. coli* and enterococci are applied directly as the 30-day geometric mean for AML at the permitted compliance discharge point. The MDL for Non-POTWs and AWL for POTWs is set equal to the Statistical Threshold Value (STV). This approach is the simplest for facilities’ operational compliance and is the most common method used to develop bacterial effluent limits because there is no consideration of dilution or mixing with the receiving water. Due to the natural variation of bacteria, EPD does not consider dilution nor allow a mixing zone for bacteria, see Section 6.16 below for further discussion of mixing zones.

For *E.coli*, the long-term, AML is set as the 30-day geometric mean of 126#/100 mL and is calculated each calendar month. The short-term, MDL and AWL is set as the STV of 410#/100mL in any calendar month. For enterococci, the long-term, AML is set as the 30-day geometric mean of 35#/100 mL and is calculated each calendar month. The short-term, MDL and AWL is set as the STV of 130#/100mL in any calendar month.

6.1.2.1 WQBELs and the removal of bacteria criteria specific to non-human sources

As described in Section 2.1, the bacteria criteria for *E. coli* and enterococci no longer include separate, higher numeric criteria for fecal coliform for waters where water quality and sanitary studies show levels from non-human sources exceeding the in-stream water quality standards. As a result, WQBELs derived from the new *E. coli* and enterococci bacteria criteria will not allow any modifications for permit limits in response to water quality or other studies indicating non-human sources of bacteria. Currently, there are only four issued permits that have “end-of-pipe” fecal coliform limits informed by the higher numeric criteria for fecal coliform where water quality and sanitary studies show levels from non-human sources exceeding the in-stream water quality standards. Of the four permits, two are in the process of permit renewal with year-round permit limits.

6.1.2.2 Permitting

EPD reviewed all effective permits with fecal coliform limits. Approximately 80% of these permits have a fecal coliform AML of 200 counts/100 mL (geomean) and AWL of 400 counts/100 mL. At the time of permit reissuance, these permits will be given the appropriate in-stream water quality standard for the new bacteria indicators (AML of 126 counts/100 mL (geomean) and AWL of 410 counts/100 mL for *E. coli*, or AML of 35 counts/100 mL (geomean) and MDL of 130 counts/100 mL for enterococci).

Approximately 14% of permits have a fecal coliform monthly geomean limit of 23 counts/100 mL. These permits all follow the reuse requirements as specified in EPDs 2002 *Discharges in the Metro Chattahoochee Basin* Memo. These permits will receive an AML of 20 counts/100 mL (geomean) for *E. coli*. This limit was informed by the information collected and published by US EPA in the 2012 *Guidelines for Water Reuse*. The remaining 6% of permits will be evaluated on a case-by-case basis.

A small number of facilities have seasonal limits. As permits are reissued with the new bacteria criteria, the seasonal limits will be removed, since the facilities were designed to meet the more stringent summer-time effluent limit it is reasonable to require the facility to meet the more stringent limit year-round limit as a technology based effluent limit.

6.1.2.3 Compliance

Facilities with treatment technology for fecal coliform will utilize the same treatment technology for *E. coli* and enterococci. EPD does not anticipate that facilities will have compliance concerns meeting the *E. coli* and enterococci permit limits. If facilities need assistance identifying an approved laboratory or need training on *E. coli* sample collection, EPD can provide technical assistance.

6.1.3 Implementation of TMDLs in NPDES Wastewater Permits

If an applicant discharges to a waterbody with a bacteria TMDL and/or the applicant reports bacteria as “believed present” on an application, has a sanitary waste stream or if the facility is listed in the bacteria TMDL with a bacteria wasteload allocation, then the NPDES wastewater permit will be issued with monitoring and/or effluent limitations in accordance with the requirements of the applicable TMDL. Concurrent to this process, the fecal coliform TMDLs will be updated providing WLAs for the new bacterial indicator to protect designated uses. See Section 4.0 above for further discussion on bacteria TMDLs.

6.1.4 Federal Effluent Limit Guidelines Implemented in NPDES Wastewater Permits

EPD will continue to implement federal Effluent Limit Guidelines (ELG) for Non-POTW permits. NPDES wastewater permits will be issued with the specific bacterial indicator identified in the ELG and the appropriate bacterial indicator for the designated use of the waterbody.

6.1.5 Effluent Limit Compliance Schedules in Wastewater Permits

If an effective wastewater NPDES permit has never had a bacteria effluent limit, at the request of the permittee, a schedule to allow for the implementation of a water quality based effluent limit may be established by EPD and included in the permit per Chapters 391-3-6-.03(2)(g) and 391-3-6-.06 (10). The schedule must be the shortest reasonable period of time necessary to achieve compliance. EPD believes a 24-month compliance schedule is a reasonable amount of time to upgrade a POTW to include disinfection treatment. EPD will not provide compliance schedules to permittees with effective permits that already have bacteria effluent limits.

6.1.6 Mixing Zones.

The water quality bacteria criteria that originated from US EPA's 2012 recreational water quality criteria are designed to protect the public from exposure to harmful levels of pathogens while participating in water-contact activities such as swimming, tubing, wading, and surfing in all water bodies designated for such recreational uses (both primary and secondary recreation). EPD does not and will not approve mixing zones (allow dilution) in the development of permits limits for bacteria.

6.1.7 Sufficiently Sensitive Analytical Test Method.

A sufficiently sensitive analytical test method shall be used as required by 40 Code of Federal Regulations (CFR) Part 136 of the federal regulations and the detection limit shall be provided to EPD upon request. In accordance with 40 CFR §122.44(i)(1)(iv)), a method is considered "sufficiently sensitive" when "(1) The method minimum level (ML) is at or below the level of the effluent limit established in the permit for the measured pollutant or pollutant parameter; or (2) The method has the lowest ML of the analytical methods approved under 40 CFR part 136 or required under 40 CFR chapter I, subchapter N or O for the measured pollutant or pollutant parameter."

6.1.1 Antidegradation Considerations

In Georgia, an antidegradation review is triggered when there is:

- An increase in a permitted pollutant loading,
- A discharge of a pollutant not currently discharged, or
- An increase in the mass of a pollutant discharged that triggers the need for a new effluent limitation.

The replacement of the fecal coliform effluent limit with either *E. coli* or enterococci effluent limits is considered equivalently protective of the instream water quality fecal coliform criteria, so there is no expected increase in a permitted pollutant loading for bacteria, there will not be a discharge of a pollutant not currently being discharged, and there will not be an increase in the mass of a pollutant discharged triggering the need for a new effluent limitation. The *E. coli* or enterococci effluent limits apply water quality criteria at the "end-of-pipe" and a discharge in compliance with the effluent limits will not cause or contribute to excursions above the current water quality criteria for fecal coliform nor the new *E.coli* or enterococci criteria. Therefore, EPD believes that the replacement of fecal coliform effluent limits with *E. coli* and enterococci effluent limits is compliant with Section 303(d)(4)(A) and Section 303(d)(B) of the CWA as the existing effluent limitations are based on either a WLA or TMDL, and the water quality modeling indicates that attainment of the water quality standards is assured. EPD does not believe that the change in bacteria indicator will result in further degradation of the receiving water(s) or have any effect whatsoever regarding the protection of designated uses.

6.1.8 Anti-backsliding

Changing the pathogen indicator and associated effluent limits in NPDES point source permits is not considered backsliding. The inclusion of *E. coli* and enterococci effluent limits simply use a different pathogen indicator to provide the same level of protection for the designated use of primary and secondary contact recreation as is currently required in Section 301(b)(1)(C) of the CWA and at 40 CFR 122.44(d).

6.1.9 Watershed Protection Plans

Certain permit holders are required to conduct a Watershed Assessment (WA) and develop and implement a Watershed Protection Plan (WPP). These documents require the permit holder to conduct water quality monitoring of streams and other waterbodies within their jurisdictional and service area boundaries. Monitoring for fecal coliform and *E. coli* or enterococci has been included in EPD guidance for the development of the WA and WPP documents since 2005.

When US EPA approves the proposed change in the pathogen bacterial indicators, EPD will revise the WA and WPP guidance documents to reflect the new bacteria indicators are the only bacteria parameters that should be sampled upon U.S. EPA approval. In addition, EPD will notify appropriate permit holders that the new bacteria criteria has been approved and fecal coliform sampling under their WA or WPP may cease and only *E. coli* or enterococci sampling is required.

6.2 NPDES Nonpoint Source Stormwater Permitting.

Stormwater NPDES permitting falls under three broad categories: construction stormwater, industrial stormwater, and municipal stormwater. Of those, only the General Permit for Stormwater Discharges Associated with Industrial Activity (Permit No. GAR050000, “IGP”) and the Municipal Separate Storm Sewer System (MS4) permits for Phase 1 Large Communities include requirements specific to bacteria. EPD does not plan to open and modify current permits to include *E. coli* or enterococci. However, EPD is currently in the process of reissuing the IGP. As part of the reissuance process, EPD is proposing modifications to “Appendix C – Impaired Stream Segment Sampling and Requirements” to reflect the proposed change to the pathogen indicator. Facilities that discharge to a stream segment listed as impaired or assessment pending for bacteria will be required to conduct sampling for the current pathogen indicator and assess their best management practice (BMP) performance against the applicable in-stream water quality standard to demonstrate that the discharge will not cause or contribute to an exceedance of a water quality standard.

Upon approval of the bacteria criteria by US EPA and notification by EPD, Phase 1 Large MS4 permittees will be expected to revise their Impaired Waters Plan (IWP) and begin sampling for *E. coli* in place of fecal coliform according to current permit requirements. For consistency, Phase 1 Medium and Phase II (population exceeding 10,000) MS4 permits will be revised upon reissuance to reflect the same bacteriological monitoring requirements, as in the Phase I Large MS4 permits. Permittees are required to provide an assessment of the data trends over time and determine the effectiveness of the BMPs employed to return the water to compliance with in-stream water quality standards. EPD will solicit permittee and stakeholder feedback on all updates regarding bacteria indicators and limits during the permit reissuance process.